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THE REPTILES AND AMPHIBIANS OF MANISTEE
COUNTY, MICHIGAN.

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The following report is based upon data secured by the writer while engaged in a study of the reptile-amphibian fauna of Manistee County for the Michigan Geological and Biological Survey. Headquarters were established at the town of East Lake, and an intensive study made of the surrounding region. The work about East Lake was supplemented by a trip to Onekama, twelve miles north, and two trips along the Manistee River in the eastern part of the county.

The country worked is the typical sand region bordering Lake Michigan. The town of East Lake is located on the east shore of Lake Manistee, an inland lake about four miles long and one mile wide, which lies approximately parallel to

Lake Michigan and about one mile distant from it. The shores are for the most part high sand bluffs, except on the north where they are low and marshy. The Manistee River, the main water course of the county, enters the lake on the northeast and flows out on the northwest through a deep channel into Lake Michigan. The Little Manistee, a much smaller stream, empties into Lake Manistee at the southern end. There are very few small lakes or ponds in the vicinity.

Most of the region studied consists of slightly rolling sand plains high above the surface of the lake. These sand plains were once covered with pine but have been cut over and are growing up to bushes and small second growth timber. Portions of the plains are being cleared for farms, but much of the country is still wild land. Large dunes occur along Lake Michigan, and many of these are shifting.

Perhaps the most striking physiographic feature of the country is the flood-plain of the Manistee River. For eighteen or twenty miles above Manistee the river has a flood-plain varying in width from one-half to three or four miles through which it has meandered leaving it intersected by hundreds of bayous. The vegetation on the flood-plain is of the low marsh type—willows and other lowland bushes, reeds, rushes, and marsh grass. The bayous are largely choked with water plants.

The slope from the sand-plain to the flood-plain is for the most part very steep, although in some few places it is more gradual. The vegetation of the slopes is similar to that of the sand plains except that it is more luxuriant.

The reptile-amphibian fauna of the region, though composed of a comparatively large number of species, is not represented by large numbers of individuals. Only a few of the more common species occur in large numbers and many are only occasionally met with. As was to be expected, the flood-

plain of the Manistee River, with its many bayous, and the moist slopes to the sand plains furnished by far the largest number of species.

LIST OF SPECIES.

1. *Necturus maculosus* Rafinesque. No individuals of this species were observed, but fishermen are reported to have taken them in nets in Lake Manistee and Lake Michigan.

2. *Ambystoma punctatum* (Linnaeus). Although no spotted salamanders were observed, specimens from Manistee County are in the museum collection. The species is probably not rare but locally distributed.

3. *Ambystoma jeffersonianum* (Green). The museum collection contains specimens from Manistee County. None were found by the writer.

4. *Plethodon erythronotus* (Green). This appears to be the common salamander of the region. Although widely distributed it is closely confined to the shady, damp banks of the rivers, bayous, and lakes, where many of the decaying logs yielded a dozen or more individuals. On the plains it was found only in the larger decaying logs. In late June and early July many females were found with nests and eggs, all of the latter in early stages of development, and many females taken at this time contained almost fully developed eggs. It is probable that the egg laying period in the region is approximately from June 25 to July 5.

5. *Bufo americanus* Le Conte. The toad is common but not abundant. A few light-colored specimens were collected along the shore of Lake Michigan, and small individuals were observed on the sand-plains in July. In late September several adults were taken in gardens and about wells where they were apparently preparing to hibernate.

5. *Rana pipiens* Shreber. The leopard frog is common throughout the region. It is closely confined to the semi-aquatic habitats, seldom wandering to the sand plains.

7. *Rana palustris* Le Conte. While not occurring abundantly in the region about East Lake the species was found about cold springs and streams in the vicinity of Onekama. It was also found in considerable numbers on the banks of the Manistee River in the eastern part of the county.

8. *Rana clamitans* Latreille. The green frog is common in all favorable habitats. It occurs in numbers about the small lakes and along the rivers, bayous, and drainage ditches.

9. *Rana cantabrigensis* Baird. The wood frog is apparently not common. A single specimen was taken in a cold stream at Onekama and a few were observed along the Manistee River in the eastern part of the county.

10. *Rana catesbeana* Shaw. The bull frog is apparently not rare in Manistee County. No specimens were taken, but they were frequently heard at night and two caught along the river by fishermen were examined.

11. *Eumeces quinquilineatus* (Linnaeus). The known range of the blue-tailed skink in Michigan is considerably extended by the taking of a single specimen in Manistee County. Hitherto it has been known only from the southern half of the southern peninsula.¹ It has been reported from counties in the southwestern part of the state, but no specimens have been available for examination except from Huron, Gratiot, St. Clair, Oakland, Lenawee, and Monroe Counties. The specimen taken in Manistee County is a nearly adult individual and was found in a pile of old timbers at the edge

¹ Ruthven, A. G. The Reptiles of Michigan. Mich. Geol. and Biol. Surv., Pub. 19, Biol. Ser. 3, pp. 79-81.

of a bayou. The species seems to be rare but probably occurs in favorable habitats throughout the region.

12. *Storeria dekayi* (Holbrook). The brown snake is common. It frequents the second growth woodlands, especially the damper portions.

13. *Heterodon platyrhinus* Latreille. The sand region furnishes a favorable habitat for the hog-nosed snake. Though not occurring in large numbers it is common on the plains and along the sandy shores of bayous and lakes.

14. *Natrix sipedon* (Linnaeus). The water snake frequents the many bayous of the Manistee River flood-plain but is apparently nowhere abundant.

15. *Regina leberis* (Linnaeus). A single specimen of the queen snake from Manistee County is in the museum collection. It is probably not common in the region.

16. *Liopeltis ternalis* (DeKay). The green snake is reported as common in the vicinity of East Lake and there are specimens from near Manistee in the museum collection, but it was not observed by the writer.

17. *Lampropeltis doliatius triangulus* (Boie). The sand plains furnish a favorable habitat for the milk snake. Secretive in its habits, it is rather difficult to capture and is not frequently seen. It seems, however, to be a common species in the region.

18. *Thamnophis sirtalis* (Linnaeus). The common garter-snake is one of the most abundant reptiles of the region. It occurs in numbers in the semi-aquatic habitats, and less frequently on the sand plains.

19. *Sistrurus catenatus* (Rafinesque). No rattlesnakes were seen and they are reported as rare in the vicinity of East Lake but are said to occur frequently in the swamps farther

inland. They are undoubtedly becoming more rare with the clearing of the land.

20. *Chelydra serpentina* (Linnaeus). The snapping turtle evidently does not occur in large numbers in the region. Only one specimen was taken, and no others were seen, although the many bayous would seem to furnish an especially favorable habitat.

21. *Chrysemys cinerea* (Bonnaterre). This is the common turtle of the region. It occurs in numbers everywhere in the bayous, streams, and lakes, and many were found on the plains.

22. *Terrapene carolina* (Linnaeus). The box turtle is not common. No specimens were taken, but two individuals which were said to have been taken along the river about fifteen miles from East Lake, were examined. It is probable that the species occurs only rarely. This is to be expected since in this region it is probably reaching the northernmost limit of its range in the state. It has not before been known except in the southern part of the southern peninsula. (Ruthven, op. cit., p. 157.) There are specimens from Cass, Calhoun, and Washtenaw Counties in the Museum, and it has been reported from Van Buren, Kalamazoo, Barry, Eaton, and Montcalm Counties.

23. *Clemmys insculpta* LeConte. One specimen of the eastern wood tortoise was taken and two others examined. The individual taken was found on a sand bank along the Manistee River. Previous to 1915 this species was not known to occur in Michigan. During the field work of this year it was found in Schoolcraft County in the northern peninsula and in Manistee County and Missaukee County in the southern peninsula.